

described in the specification in such a way as to reasonably convey to one skilled in the art that the inventor at the time the application was filed had possession of the claimed invention and for allegedly being non-enabling. The Office Action further alleges that Claims 45-49, 51-84, 96, 181 and 203-248 conflict with Claims 57-63 and 68-87 of copending application Serial No. 08/486,669. Moreover, the Office Action has provisionally rejected Claims 45-49, 51-84, 96, 181 and 203-248 under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over Claims 57-63 and 68-87 of copending application No. 08/486,699. Finally, Claims 45-49, 51-84, 96, 181 and 203-248 are rejected under 35 U.S.C. §103 as defining subject matter which is allegedly rendered obvious over an article in Chemical Physics Letter, 1990, 167-170 ("Kratschmer, et al.") in view of U.S. Patent No. 3,094,428 to Hamilton, et al. ("Hamilton, et al.") and an article by Kargin, et al. in the Colloid Journal of the USSR, 1967, 29, 256-259 ("Kargin, et al.").

In response thereto, applicants are submitting the following comments which are deemed to place the present case in condition for allowance. Favorable consideration is respectfully requested.

The Office Action has rejected Claims 45-49, 51-84, 96, 181, 203-248 under 35 U.S.C. §112, second paragraph for various reasons. According to the Office Action, in Claims 45, 181 and 233-234 and claims dependent therefrom, it is unclear

as to how much "constitutes amounts capable of being extracted in 'solid' form".

Applicants disagree. The language in these claims connotes that the C<sub>60</sub> being formed is in amounts that could be seen with the human eye. The claims connote this amount in functional language by reciting that the C<sub>60</sub> is present in amounts capable of extracting C<sub>60</sub> from the soot in solid form and that it is recovered as a solid. This is the intent of the language utilized. Applicants submit that the presence or absence of sufficient material to be visible as a solid is a characteristic that is easily determinable.

However, the Office Action alleges that such a limitation is indefinite, and specifically asks that if ... a microgram of C<sub>60</sub> was an amount needed to qualify as solid C<sub>60</sub>, would a process which produced a kilogram of soot which in toto contained microgram C<sub>60</sub> ... be within the claims...?" In addition, the Office Action alleges that the language is indefinite for it does not specify the lower limit.

Applicants respectfully submit that the Office Action's comments have been contradicted by case law. Case law has held that lower limits need not be recited in claims to be in compliance with 35 U.S.C. §112, second paragraph. In re Kirsch, 498 F.2d, 1389, 1393-1394, 182 USPQ 286, 290 (CCPA 1974). Furthermore, and more importantly, the lower limit is that which is visible to the eye! How can anything be more definite than visible versus not visible? From the beginning

of time, man has relied upon his senses to determine if something is present. The amount of C<sub>60</sub> and/or C<sub>70</sub> produced by the process of the present invention is in macroscopic amounts, amounts which are easily discernible by the human eye. The objective test is whether visible amounts, that is, amounts sufficient to see, and touch, of C<sub>60</sub> and/or C<sub>70</sub> are recovered. Thus, there is no indefiniteness in the amount produced.

The same comments are also applicable to the rejection of Claims 83, 84 and 222.

With respect to the rejection of Claims 83, 84, and 222, the Office Action alleges that the language, "amount (or quantities) (of C<sub>60</sub>) sufficient to be capable of producing a colored solution when extracted with sufficient (or effective) amounts of benzene" is unclear. Applicants disagree for the same reasons as hereinabove. This language connotes that sufficient (C<sub>60</sub> or C<sub>70</sub>) is present so that when dissolved in a non-polar organic solvent, such as benzene, the non-polar organic solvent will become colored. Again, this is an objective test of whether appreciable amounts of C<sub>60</sub> and/or C<sub>70</sub> are formed. If the benzene solution remains uncolored when the soot comprising C<sub>60</sub> and C<sub>70</sub> is placed into sufficient benzene to dissolve the C<sub>60</sub> and/or C<sub>70</sub>, then insufficient amounts of product are generated; on the other hand, if the benzene solution becomes colored, then a sufficient amount of C<sub>60</sub> or C<sub>70</sub> is generated. The United States Patent and Trademark Office raises the issue that this is indefinite; however, the test is

color versus no color, i.e., something which is easily determinable and discernible, and which is an objective rather than subjective standard.

In both situations, the United States Patent and Trademark Office has failed to consider the history regarding fullerenes. Heretofore, no one had generated enough fullerenes, such as C<sub>60</sub>, to be seen with the naked eye, or as indicated in Curl, et al., in Scientific American, 1991, Page 55, when dissolved in benzene produced a colored solution. Others heretofore could not generate sufficient amounts of C<sub>60</sub> to obtain a colored solution. For example, when Smalley, et al. placed the soot they produced in benzene, the solution remained clear and the black soot sat on the bottom of the liquid. Id. However, the methodology of the present process produces such appreciable amounts of C<sub>60</sub> and/or C<sub>70</sub> that they can be visibly seen and they produce a colored solution when the C<sub>60</sub> and/or C<sub>70</sub> extracted from the soot preparing in accordance with the present invention is placed into benzene. Not only does this distinguish over the prior art, but as indicated hereinabove, these are simple tests to easily ascertain whether the requisite amount of product is produced.

The Office Action appears to have misinterpreted the claims; it utilizes as the standard the amount of sooty carbon product produced which when placed into benzene forms a colored solution. The claims do not use this as the criteria, since the soot goes to the bottom of the liquid. The color is formed

when sufficient amounts of C<sub>60</sub> and/or C<sub>70</sub> are present in the soot sample. Thus, if a colored solution is produced under these circumstances then it meets the test recited in Claims 83, 84 and 222.

The Office Action has rejected Claim 234 and those dependent therefrom, alleging that the term "discernible" is indefinite. Applicants disagree. The term "discernible" is not an ambiguous term but connotes that the product is capable of being detected with the eyes or other senses. Applicants are using the term in its normal everyday meaning. See the definition of "discern" and "discernible" from Webster's New Collegiate Dictionary, p. 360, previously submitted. Again, just as described hereinabove, the claims connote that the product is being formed in amounts that could be detected by one's senses. Again, for the reasons given hereinbelow, this language is unambiguous.

Finally, the Office Action alleges that Claims 204, 213, 222 and 230 and those dependent therefrom and Claims 45 and 232 are indefinite alleging that the extraction language recited in the claims is a means plus function encompassed by 35 U.S.C. §112, sixth paragraph and that the specification fails to set forth the equivalents thereto, citing in In re Dossel, 115 F.3d 942, 42 USPQ 2d 1881 (Fed. Cir. 1991). Throughout this rejection, the Office Action has cited In re Dossel, alleging that it holds that the claims fail to comply with 35 U.S.C. §112 second paragraph, for it does not provide

equivalents to the alleged functional limitation recited in the claims therein.

Applicants respectfully submit that the claims are not subject to the provision of 35 U.S.C. §112, sixth paragraph, because there is no recital of function associated therewith.

35 U.S.C. §112, sixth paragraph states:

An element in a claim for a combination may be expressed in a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification or equivalents thereof.

Case law has held that claiming a step by itself or even a series of steps does not implicate the provision of this statute since merely claiming a step without recital of function is not analogous to a means plus a function. O.I. Corp. v. Tekmar Co., 115 F.3d. 1576, 1583, 42 USPQ2d 1777, 1782 (Fed. Cir. 1997).

This is the situation here. The claims recite therein an "extraction step", e.g., in terms of extracting C<sub>60</sub> in solid form "from said sooty carbon product" but the step of "extraction" is not associated with any function. Nor has the Office Action indicated any function associated therewith. Thus, applicants respectfully submit that the method claim is not drafted in a step-plus-function form and is thus not subject to this provision. As the Federal Circuit has held:

...Merely claiming a step without recital of a function is not analogous to a means plus a function...we must be careful not to extend the language of the provision to situations not contemplated by Congress. If we were to construe every process claim containing steps described by an "ing" verb, such as passing, heating, reacting, transferring, etc. into a step-plus function limitation, we would be limiting process claims in a manner never intended by Congress...

Id. 115 F.3d at 1583, 42 USPQ2d at 1782.

Thus, for the reasons given hereinabove, it is respectfully submitted that the provision of 35 U.S.C. §112, sixth paragraph, is not applicable.

Moreover, applicants respectfully disagree with the Office Action's interpretation of In re Dossel, 115 F.3d 942, 92 USPQ2d 1881 (Fed. Cir. 1997). In re Dossel does not hold that to comply with 35 U.S.C. §112 sixth paragraph, applicants must disclose equivalents in the specification. On the contrary, In re Dossel holds that 35 U.S.C. §112, sixth paragraph, implicates 35 U.S.C. §112, second, paragraph. Id. With respect to the second paragraph requirement, the specification must set forth an adequate disclosure of what is meant by the step plus function language. Id. Failure to describe adequately the necessary structure, material, or acts in the written description means that the applicant has failed to comply with 35 U.S.C. §112, second paragraph. Id. However, this does not imply that the application must describe equivalents, as alleged by the Office Action.

Moreover, contrary to the allegation by the United States Patent and Trademark Office especially with respect to the rejection of the various claims, the specification adequately describes the extraction step. Attention in this regard is directed to Page 5, Line 9 to Page 7, Line 17 of the instant specification, which provides examples of extractions contemplated by the claims, e.g., removing C<sub>60</sub> from the soot, e.g., by dissolving the soot in a non-polar solvent and by sublimation. Thus, even if 35 U.S.C. §112, sixth paragraph were applicable in the present circumstances, which it is not, the specification provides sufficient description to convey what is meant by the extraction language utilized in the claims. Extraction is a term of art that is readily understood by the skilled artisan. Applicants submit, therefore, that the extraction language in the identified claims does not render the claims indefinite for failing to particularly point out and distinctly claim the invention. Applicants respectfully submit that the metes and bounds of the extraction language utilized in the claims are clearly understood, in compliance with the requirements of 35 U.S.C. §112, second paragraph.

Thus, for the reasons provided, the rejection of the claimed subject matter under 35 U.S.C. §112, second paragraph, is obviated. Withdrawal thereof is respectfully requested.

Pursuant to the rejection of Claims 45-49, 51-82, 203 and 232 under 35 U.S.C. §112, first paragraph, the Office

Action alleges that the specification does not have descriptive support for the term "macroscopic".

Applicants strongly disagree.

With respect to the description requirement, there is adequate support in the application for the term "macroscopic". Literal support is not necessary for compliance with the description requirement as long as the application conveys the concept to the skilled artisan. This the application adequately does. More specifically, support for this term and concept permeates the specification. For example, attention is directed to Example 1 of the instant specification wherein it is specified that the C<sub>60</sub> product is obtained as a powder and wherein the color of the product produced therefrom is indicated. Obviously, the isolation of a product as a powder taken together with the fact that it is a colored powder connotes that the product could be seen with the naked eye, consistent with the use of macroscopic amounts recited in the claims. Furthermore, attention is directed to Page 7, Lines 10-25 of the specification, where it describes that when the sooty product was placed into a non-polar solvent, e.g., benzene, the benzene became colored and the product produced after extraction with the non-polar solvent is colored. Obviously, one cannot determine these characteristics unless it is present in amounts that can be seen with the naked eye, i.e., macroscopic amounts. For example, if less than macroscopic amounts were produced, no color would be seen.

See, Curl, et al, Scientific American 1991, 54-55. In addition, attention is directed to Page 11, Line 30 of the instant specification wherein it is indicated that the IR is taken of an approximately two micrometer thick C<sub>60</sub> coating on a silicon substrate. Especially since C<sub>60</sub> is colored, it is obvious that this coating had to seen with the naked eye. Furthermore, the application makes additional references to characteristics of the product that can only be discernible if the material is present in macroscopic amounts. For example, the application describes that the product produced by sublimation of the carbon soot can range from a uniform film to a coating, and the color is brown to gray depending on the thickness of the coat formed, while the product obtained from extraction is a dark brown to black crystalline material. Obviously, these characteristics can be differentiated if the product was produced in amounts that can be seen with the human eye. In addition, on Page 2, Line 13, the application states that before the prior invention, no one had made C<sub>60</sub> or C<sub>70</sub> in appreciable amounts. The implication is that the present inventors were successful in achieving this goal, consistent with the teachings in the application. Appreciable by definition means "enough to be perceived", See Webster Unbridged Dictionary 2nd Ed. p. 91 (1983), previously submitted. Thus, "appreciable" is synomous with "macroscopic".

Case law has held that the description requirement is met if the application conveys to the skilled artisan that the

applicants have possession of the invention at the time of the filing of the application. Vas Cath Inc. v. Mahurkar, 935 F.2d 1535, 19 USPQ2d 1111 (Fed. Cir. 1995). In other words, the applicant must convey with reasonable clarity to the skilled artisan that as of the filing date he or she was in possession of the invention. Vas Cath Inc., 935 F.2d at 1563-64, 19 USPQ 2d at 1117. Attention is directed to the Kroto Declaration previously submitted, Paragraphs 14 and 15, in which he attests that the application adequately describes the method for making macroscopic amounts of fullerenes, such as C<sub>60</sub> and C<sub>70</sub>, and that based upon the teachings in the application, it is his opinion that the inventors had in their possession at the time of the filing of the application macroscopic amounts of same. (Emphasis added). Kroto, who is a skilled artisan in the field, understood from reading the application that the applicants had made macroscopic amounts of fullerenes and had it in their possession at the time of the filing of the application, providing further evidence that there is adequate support in the specification for the term "macroscopic". Since a skilled artisan testified that the application describes the production of fullerenes, such as C<sub>60</sub>, in macroscopic amounts, how can the United States Patent and Trademark Office ignore or dismiss such a statement? Case law had held that if a person of ordinary skill in the art would have understood from reading the specification that the inventor had possession of the claimed invention at the time of filing the application, then

the written description required by 35 U.S.C. §112, first paragraph, is met. In re Alton, 76 F.3d 1168, 37 USPQ2d 1578 (Fed. Cir. 1996). Since Dr. Kroto so testified, then the written description requirement is met. Id.

Attention is also directed to the Decision of the Board of Patent Appeals and Interferences ("Board") dated September 23, 1999, Pages 30-37, attached hereto as Exhibit 1 wherein the Board held that it interpreted the term "macroscopic" to be used in its ordinary well accepted meaning of visible with the naked human eye (Page 36) and where the Board held that the specification contained evidence that this product obtained from Example 1 was visible to the eye (Page 35). From these statements, it is apparent that the Board concluded that the specification connotes to the skilled artisan at the time of the filing of the application that the inventors had in their possession a process, which is described in the application, for producing C<sub>60</sub> in macroscopic amounts.

As further evidence, attached hereto as Exhibit 5 is the article by Kratschmer, et al. in Nature, 347, 6291, pp. 354-358 (1990) which was published shortly after the filing of USSN 07/575,254, (having a filing date August 30, 1990) and USSN 07/580,746 (having a filing date September 10, 1990) which are two of the parent applications for which the present specification rules under 35 U.S.C. §120. Moreover, the Nature article was submitted and accepted before the filing of the latter application. The Nature paper describes an embodiment

of the process described in the above-identified application. In particular, it describes a process for producing C<sub>60</sub> in accordance with the procedure described in Example 1 of the instant specification, and it shows that inherently the process described therein produces C<sub>60</sub> in macroscopic amounts.

In fact, the scientific community has recognized Huffman and Kratschmer for being the first to develop a process for producing fullerenes, including C<sub>60</sub>, in macroscopic amounts. Attention is directed to the Scientific American article to Curl, et al. referred to hereinabove which acknowledges from Smalley, et al. that Huffman and Kratschmer were the first to devise a process for preparing fullerenes e.g., C<sub>60</sub>, in macroscopic amounts. See also, the enclosed videotape entitled "Molecules with Sunglasses" attached hereto as Exhibit 6.

As further evidence, enclosed herewith is a copy of an award given to Huffman and Kratschmer from the European Physical Society, attached hereto as Exhibit 2. Huffman and Kratschmer earned the award for their Discovery of New Molecular Forms of Carbon in the Solid State. In particular, attention is directed to the second page on which is printed the date of March 30, 1994, wherein it is stated that Kratschmer and Huffman

"found that under certain conditions, C<sub>60</sub> is abundant in soot produced by a carbon arc and cooled by helium. They could dissolve C<sub>60</sub> (and C<sub>70</sub>) out of the soot, produce crystals, and

verify the predicted soccer ball structure".

Thus, the European Physical Society honored Huffman and Kratschmer for finding the conditions for producing C<sub>60</sub> in abundant amounts in soot and extracting it therefrom.

Attention is also directed to the MRS Bulletin, March 1994 attached hereto as Exhibit 3, which describes the Materials Research Society Award received by Kratschmer and Huffman for "the discovery of a way to produce macroscopic quantities of the fullerenes..." Both of these awards are based upon the process described and published in the Nature article, and the replication thereof by a number of scientists to verify that the process described therein produces macroscopic amounts of C<sub>60</sub>. Moreover, attention is directed to Exhibit 4 which is the statement from the Royal Swedish Academy of Sciences when it awarded Drs. Kroto, Smalley and Curl the Nobel Prize in Chemistry in 1996. In fact, in the statement set forth by the Royal Swedish Academy of Sciences, it acknowledged that Huffman and Kratschmer were the first to produce isolable amounts of fullerenes, e.g., C<sub>60</sub>. Again, it is apparent that reference is made to the fact that the Huffman and Kratschmer process, if followed generates macroscopic amounts of fullerenes, including C<sub>60</sub>.

Since the description of the process in the Nature article is also described in the present application, and since the process described therein and in the present application

produces inherently macroscopic amounts of C<sub>60</sub>, all of this evidence leads to one conclusion: at the time of the filing of the application, the inventors had in their possession a process for producing macroscopic amounts of C<sub>60</sub>.

Thus, for the reasons given herein, it is respectfully submitted that the application fully complies with the description requirement of 35 U.S.C. §112, first paragraph.

In addition, the specification fully complies with the enablement requirement of 35 U.S.C. §112, first paragraph, and adequately teaches one skilled in the art how to make the claimed invention without an undue amount of experimentation. The specification provides on Pages 3-7 thereof the general teaching to the skilled artisan of how to prepare C<sub>60</sub> and C<sub>70</sub> in macroscopic amounts. Further, specific examples are provided in the application. If the skilled artisan follows the procedures described in the specification, including the specific examples, macroscopic amounts of material are produced. Attention is again directed to the Declaration of Kroto, paragraphs 3, 8 and 15, wherein he attests that the application adequately describes how to make fullerenes, including C<sub>60</sub> and C<sub>70</sub>, in macroscopic amounts. Contrary to the allegations in the Office Action, case law does not require the applicant to describe in their specification every conceivable embodiment of the invention. US v. Telelectronics, 857 F.2d 778, 786, 8 USPQ 2d 1217, 1222 (Fed. Cir. 1988) (citing SRI Int'l v. Matsushita Elec. Corp. of America, 775 F.2d 1107,

1121, 227 USPQ 577, 586 (Fed. Cir. 1985)). The specific teachings and exemplification in the specification provide an adequate teaching to accomplish this objective without an undue amount of experimentation. Again, it is improper for the United States Patent and Trademark Office to ignore the testimony of Dr. Kroto, a skilled artisan, who testified that the application adequately describes to the skilled artisan how to make macroscopic amount of C<sub>60</sub>.

Moreover, attention is directed to Example 1 and the description in the Nature article published by Huffman and Kratschmer, wherein it shows that the process of Example 1 inherently produces macroscopic amounts of C<sub>60</sub>. Moreover, attention is directed to the aforementioned pages of the Board decision, which held that the specification provides evidence that the process of Example 1 produces macroscopic amounts of C<sub>60</sub>. Example 1 describes in great detail the process of producing C<sub>60</sub> in macroscopic amounts in the soot and its extraction therefrom. Therefore, since the specification provides a detailed description of the steps of the claimed process and since by following the teaching, one produces C<sub>60</sub> in macroscopic amounts, as found by the Board and described in the Nature article, it necessarily follows that the process in the specification is enabling for the production of C<sub>60</sub> in macroscopic amounts.

Thus, the application is enabling for the subject matter claimed. Therefore, the rejection of Claims 45-49, 51-

82, 96, 203 and 232 under 35 U.S.C. §112, first paragraph, is obviated, and withdrawal thereof is respectfully requested.

Thus, the specification complies with the requirements of 35 U.S.C. §112, first and second paragraphs. Withdrawal of these rejections is respectfully requested.

The Office Action rejects Claims 45-49, 51-84, 96, 181, and 203-248, by citing 37 C.F.R. §1.78(b), alleging that these claims conflict with Claims 57-63 and 68-87 of the '669 application. The Office Action requests Applicants to either cancel the conflicting claims or to maintain a clear line of demarcation between the applications.

Applicants respectfully submit that this is an improper rejection since there is no statutory basis for the rejection. Nevertheless, there is a line of demarcation between the claimed subject matter in the present application and the claims in copending application USSN 08/486,669. The present case is directed to the preparation of C<sub>60</sub> and/or C<sub>70</sub> or products containing same in macroscopic amounts, while the copending application is directed to the preparation of fullerenes and/or products containing same in macroscopic amounts. Thus, there is a clear line of demarcation between the applications.

The Office Action maintains that to constitute a clear line of demarcation, it is necessary that the claims in the application be patentably distinct. This of course, is contrary to practice and case law. Although applicants believe

that the claimed subject matter in both applications are directed to patentably distinct inventions, this is not the standard. For example, attention is directed to MPEP §806.04 (i), which permits an application directed to a genus to issue even after the application to a species issues. Thus, it is permissive to have one application directed to a species and another application directed to a genus, as in the present circumstances. Thus, the rejection of the claims under 37 C.F.R. §1.78(b) is improper, and withdrawal thereof is respectfully requested.

In support of the provisional rejection of Claims 45-49, 51-84, 96, 181 and 203-248 under the judicially created doctrine of obviousness-type double patenting, the Office Action alleges that these claims are not patentable over Claims 57-63 and 68-87 of copending application USSN 08/486,669.

Since the claims in neither application has been patented, it is premature to reject the claims on this ground at this time, especially since these may not be the final version of the claims. When one of the applications matures into a patent, then it would be the appropriate time to raise this issue. Moreover, once the claims in one application are allowed, then applicants may consider the filing of a terminal disclaimer.

In addition, applicants further submit that the provisional double patenting rejection is not applicable in the present circumstances.

In considering the question of obviousness-type double patenting, only the claims of the two applications are compared. Quad Environmental Technologies, Corp. v. Union Sanitary District, 946 F.2d 870, 873, 20 U.S.P.Q. 2d 1392, 1394. The question to consider is whether any claims in the two applications define merely an obvious variation of an invention disclosed and claimed. In re Vogel, 442 F.2d 438, 441, 164 U.S.P.Q. 619, 622 (CCPA 1970).

The Office Action alleges that the claims are not patentably distinct from each other because the respective claims only differ in the functional recitation of how much "C<sub>60</sub> fullerene" is made in the carbon vaporization process. It further alleges that the subject matter in both applications is directed to the production and recovery of "C<sub>60</sub> fullerenes". However, applicants respectfully submit that the claims in the two applications do not differ in the manner alleged in the Office Action. The present application is directed to a process of making C<sub>60</sub> and/or C<sub>70</sub> in macroscopic amounts, while the '669 application is directed to the process of making fullerenes in macroscopic amounts. The subject matter of the present application is thus not directed to the same patentable invention as that claimed in the copending '669 application. Consequently, the rejection of the claimed subject matter on these grounds is obviated, and withdrawal thereof is respectfully requested.

Pursuant to the rejection of Claims 45-49, 51-84, 96, 181 and 203-248, the Office Action cites Kratschmer, et al. in view of Hamilton et al. and Kargin, et al.

Kratschmer, et al. describe a process of preparing carbon smoke particles by evaporating graphite rods by resistive heating in a conventional glass bell evaporator filled with an inert quenching gas such as helium at pressures greater than, for example, 100 Torr. It also discloses collecting the smoke. The article postulates that C<sub>60</sub> may be present in the smoke. But, in contrast with the present invention, the reference does not teach, disclose or suggest how to extract the C<sub>60</sub> from the soot. Thus, the reference never separated the C<sub>60</sub> from the soot.

The Office Action admits that Kratschmer, et al. never taught how to extract the alleged C<sub>60</sub> in the soot. Thus, it cites Hamilton, et al. and Kargin, et al. in an attempt to overcome this deficiency.

According to the Office Action, Kargin, et al. disclose that carbon particles made from the condensation of carbon vapor in an argon atmosphere can be deemed to be carbon black. The Examiner further alleges that the carbon particles were prepared from a graphite anode and cathode opposed to one another, wherein a plasma is formed therebetween by passing current to the electrodes. The Office Action then cites Hamilton, et al., alleging that it discloses that carbon black is dispersed in benzene to form ink compositions. The Office

Action concludes that it would have been obvious to have dispersed the carbon smoke particles of Kratschmer, et al. in benzene because Hamilton, et al. "teach that it is known to disperse carbon black in benzene in order to form ink compositions or rubber compositions and because Kargin, et al. would teach...to recognize Kratschmer's particles as being carbon black."

However, applicants respectfully submit that the United States Patent and Trademark has not made out a prima facie case of obviousness. Although both Hamilton, et al. and Kargin, et al. disclose processes involving carbon black, neither of these references teach or disclose a process for making C<sub>60</sub> and/or C<sub>70</sub>, or involving C<sub>60</sub> or C<sub>70</sub>, as presently claimed or as allegedly described in Kratschmer, et al. There is no nexus between the carbon black product in Kargin, et al. and Hamilton, et al. and the C<sub>60</sub> and C<sub>70</sub> produced in the instant invention or the C<sub>60</sub> produced in Kratschmer, et al. Thus, there is no suggestion in the prior art references to combine the secondary references with the article by Kratschmer, et al. in the manner suggested by the United States Patent and Trademark Office. Absent some teaching, suggestion or incentive supporting the combination, case law had held that obviousness cannot be established. A.C.S. Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 221 USPQ 929 (Fed. Cir. 1984). Consequently, applicants submit that the 35 U.S.C. §103 rejection is improper and should be withdrawn.

Moreover, applicants submit that Kratschmer, et al. is not a proper reference because the In re Katz Declaration of Dr. Kratschmer dated September 10, 1997 clearly establishes that the Kratschmer, et al. article is not the work of another; thus, as held in In re Katz, 687 F.2d 450, 215 USPQ 14 (CCPA), Kratschmer, et al. cannot be used in a reference to reject the claimed subject matter. Consequently, it is improper to use it in combination with Hamilton, et al. and Kargin, et al. to reject the claimed subject matter.

The Office Action indicated that the Kratschmer Declaration was ineffective to overcome the rejection, relying on certain hearsay passages in a book entitled "Perfect Symmetry: The Accidental Discovery of Buckminster fullerene" by Jim Baggott ("Baggott"). More specifically, the Office Action directs applicants attention to Pages 138-139 of Baggott, which according to the Office Action, suggests that Fostiropoulos "innovated in the matter of fabrication and use of carbon-13 rods" and Page 150 which the Office Action suggests that "Fostiropoulos innovated in the matter of sublimation of various C<sub>60</sub> films". The Office Action alleges that Baggott presents rebuttable evidence that Fostiropoulos is a co-inventor and it thereby rejects the statements in the Kratschmer declaration that Fostiropoulos is not an inventor of the subject matter in the application or in the article (Paragraphs 6 and 9 of Kratschmer Declaration).

What the United States Patent and Trademark Office has conveniently overlooked was that the statements in Baggott are hearsay, pure and simple. The Office Action is relying upon these statements in Baggott for the truth of the matters asserted, but as the author admits, he was not present in Kratschmer's laboratory at the relevant time when the events reported upon were occurring. Even Baggot admits that he is only a reporter trying to assimilate the information:

I have put together my description of the events in Heidelberg and Tucson from December 1985-September 1990 from a combination of personal interviews with Kratschmer, Fostiroopoulos, and Huffman, telephone conversations with Lamb, letters from Kratschmer and Fostiroopoulos and published accounts.

Id., Page 271.

In other words, Baggott is acting as a sieve --a filter, so to speak. Based upon the various sources, he is providing his interpretation and his viewpoints of the facts and reporting thereon. However, he has no personal knowledge of the events that occurred. Furthermore, the statements therein are not made under oath and are not sworn testimony. Thus, as an evidentiary matter, very little weight should be given to his statements.

On the other hand, the statements made by Kratschmer was made by a person who has personal knowledge of the events that occurred at the relevant time. He was there. The events occurred in his laboratory. Thus, his testimony should be given considerably more weight, especially since his statements

are given in a Declaration with a penalty attached thereto if statements were made with the knowledge that they were willful and false.

Just as in In re Katz, the United States Patent and Trademark Office is ignoring the statements in the Declaration. Specifically, it is ignoring the following statements:

6...It is my opinion that ... he [Fostiroopoulos] is not an inventor of the subject matter described and claimed herein...

8. Although K. Fostiroopoulos performed experiments described in the article, those experiments described therein which he performed were conducted under my direction and supervision.

9. It is my opinion that ... K. Fostiroopoulos is not an inventor of the subject matter described in the publication.

These statements are not surplus, but have real meaning. As the Court stated in In re Katz.

In the declaration, appellant provides the explanation that the co-authors of the publication, Chiorazzi and Eshhar, "were students working under the direction and supervision of the inventor, Dr. David H. Katz." This statement is of significance since it provides a clear alternative conclusion to the board's inference that their names were on the article because they were coinventors. As acknowledged by the examiner, the names of individuals may be given as authors of a scientific report who are "involved only with assay and testing features of the invention." Appellant's explanation is, thus, consistent not only with the content of the article but with the nature of the publication. On the record here, the board should not have engaged in further speculation as to whether appellant's view was shared by his co-authors but rather should have accepted that Chiorazzi and Eshhar were acting in the capacity indicated, that is, students working under the direction and supervision of appellant. From such a

relationship, joint inventorship cannot be inferred in the face of sworn statements to the contrary.

The Office Action alleges that although there is no dispute that Kratschmer has made a proper declaration per se, the statements therein are not convincing in view of the article naming Fostiropoulos as co-author and Baggott's description of Fostiropoulos contribution.

However, the passages of Baggott referred to in the Office Action are not inconsistent with the statements in the Kratschmer Declaration. For example, the Office Action appears to be basing its opinion that Fostiropoulos is an inventor from its interpretation of the following passage on Page 150 of Baggott:

Very late one night in early May, Fostiropoulos placed a little of the soot and a thin quartz substrate in a glass tube. He then filled the open tube with argon, which forced out the air above the soot. He heated the bottom of the tube with the naked flame of a Bunsen burner. At first, the substrate did not appear to have changed: he could see no sign of a coating. But as he looked more closely, he noticed that the reflected light from the surface of the substrate did appear different: something had been deposited.

He was extremely tired, but nothing was going to keep him from measuring the spectrum. He placed the substrate in the ultra-violet/visible spectrometer and set the machine to scan the wavelength. He watched the recording pen intently as it moved over the chart paper and, for the second time in his life he felt the electric thrill of scientific discovery. There they were, three of the strongest, most beautiful camel humps he could ever wish to see. Gone, or at least significantly reduced, was the background absorption due to ordinary carbon soot. The

sublimation process had worked: it really was that easy. He was the first person in the world to see the ultra-violet spectrum of almost pure buckminsterfullerene.

Fostiropoulos left the spectrum on Kratschmer's desk and headed home. It was time for sleep.

However, that passage is not inconsistent with the statement that Fostiropoulos worked under the supervision and control of Dr. Kratschmer, as he avers in paragraph 8 of the Declaration. Putting the facts in perspective and context of the Declaration, one would conclude that this sublimation experiment was conducted in accordance with instructions of Dr. Kratschmer. Does the United States Patent and Trademark Office expect that the advisor for the Ph.D. student would necessarily be performing the Ph.D. students' laboratory work? Does the United States Patent and Trademark Office expect the advisor to be present when a Ph.D. student performs his experiment? This is not the norm. There is nothing in the passage that would necessarily lead to a conclusion that the procedure for extracting the C<sub>60</sub> from the soot described in the above passage was Fostiropoulos' idea. Just because Fostiropoulos may have been the person who performed the actual process, that fact, in and of itself, does not necessarily make Fostiropoulos an inventor. However, the United States Patent and Trademark Office is reading more into Baggott than is really there. The United States Patent and Trademark Office appears to be reading the passages in Baggott through rose colored glasses, purposely

interpreting the facts so that they are inconsistent with the statements of Kratschmer but without any suggestion from any of the evidence on the record for it to reach that conclusion. This is improper.

The same conclusion is reached with respect to the passage referred to on Pages 138-139. This passage relates to the events surrounding the preparation of <sup>13</sup>C rods and the preparation of soot comprised of carbon-13. The Office Action is assuming that Fostiropoulos involvement in making carbon-13 soot containing C<sub>60</sub> makes him an inventor of the process for preparing C<sub>60</sub>. However, upon reflection, this fact does not provide any relevant evidence that Fostiropoulos is an inventor.

The formation of the <sup>13</sup>C rods and the use of them to generate <sup>13</sup>C soot does not provide any evidence regarding the conception of the process of forming C<sub>60</sub>, as described and claimed in the instant specification. As Baggott explains, the C-13 rods were prepared to verify that the process earlier developed by Huffman and Kratschmer produced C<sub>60</sub>. Attention in this matter is directed to pages 134, 135 and 138 and 139 of Baggott which identifies the objective of the <sup>13</sup>C experiments. As reported in Baggott, Huffman and Kratschmer had earlier developed the process for making fullerenes, including C<sub>60</sub>. Contrary to the implications by the Office Action, one would not attempt to vaporize <sup>13</sup>C rods until one had first developed a procedure for making the soot with graphite rods as

commercially available, especially in view of the difficulties and the additional expense of making and using rods made of C-13. As explained in Baggott, the use of <sup>13</sup>C rods was for diagnostic purposes, to verify that an earlier process made C<sub>60</sub>. Thus, the C-13 experiments described in the Baggott and in the Kratschmer, et al. article do not relate to the conception of the process for making C<sub>60</sub>, and other fullerenes; on the contrary, these experiments were designed to verify that C<sub>60</sub> and other fullerenes were produced in a process already conceived. Thus, Fostiropoulos' participation in the <sup>13</sup>C experiments does not evidence that he was involved in the conception of the step in the process for producing macroscopic amounts of C<sub>60</sub> in the soot. Moreover, there is no evidence in Baggott which the United States Patent and Trademark Office can point to that supports its allegations that Fostiropoulos was involved in the conception of the process step. Thus, contrary to the allegations of the Office Action, there is no evidence in Baggott that Fostiropoulos was indeed an inventor of the claimed process.

Therefore, in conclusion the United States Patent and Trademark Office has not met its burden and found any evidence contradicting the statements in the Kratschmer Declaration. Contrary to the allegations in the Office Action, Baggott does not present evidence that Fostiropoulos is more than a mere co-author. The argument in the Office Action distinguishing In re Katz, is not correct. Just as in In re Katz, there is

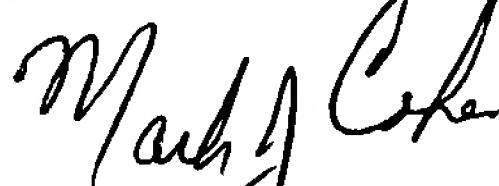
ambiguity created on the record. "The article does not tell us anything specific about inventorship". In re Katz, 687 F.2d at 455, 215 USPQ at 18. Neither does Baggott. Fostiroopoulos cannot be presumed to be a co-inventor merely from the statements of Baggott; the fact that Fostiroopoulos performed certain experiments does not necessarily mean he is an inventor. Thus, the only facts on this issue comes from the Kratschmer declaration. The Office Action thus has not made out a prima facie case of the co-inventorship of Fostiroopoulos. Therefore, contrary to the allegation in the Office Action, the holding of In re Katz is applicable.

Thus, the record is consistent with the facts alleged in the Kratschmer Declaration that the inventors of the process of making C<sub>60</sub> as described in the article and as described and claimed in the instant application are Kratschmer and Huffman. Therefore, the Kratschmer, et al. article is not an invention of another. Pursuant to the holding in In re Katz, it cannot be used as a reference against the present application. Thus, it is impermissible for the United States Patent and Trademark Office to combine the primary reference with the secondary references to sustain a '103 rejection.

Thus, for the reason given herein, the rejection of the claimed subject matter under 35 U.S.C. §103 is obviated. Withdrawal thereof is respectfully requested

Therefore, in view of the Remarks herein, it is respectfully submitted that the present case is in condition for allowance, which action is earnestly solicited.

Respectfully submitted,



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